Teacher's Edition

Grade 4 • Unit 4

Inspire Science

Information Processing and Living Things

Mc Graw Hill Education

Performance Expectations at a Glance

In this unit, students will discover and practice the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts needed to perform the following Performance Expectations.

Performance Expectations	MODULE: **Structures and Functions of Living Things**	MODULE: **Information Processing and Transfer**
4-LS1-1	●	
4-LS1-2		●
4-PS3-2		●
4-PS4-2		●
4-PS4-3		●

Correlations by Module to the NGSS

MODULE: Structures and Functions of Living Things

4-LS1	From Molecules to Organisms: Structures and Processes	
4-LS1-1	**Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** *[Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]*	12, 13, 14, 15, 16, 17, *21*, 22, 31, *39*, 41, *45–50*
SEP Science and Engineering Practices		
Engaging in Argument from Evidence Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s). • Construct an argument with evidence, data, and/or a model. (4-LS1-1)		16, 31, *38–39*, 41, 49, 50, 61
DCI Disciplinary Core Ideas		
LS1.A: Structure and Function • Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)		12–13, 14–15, 16–17, 23, 32–33, 34, 35, 36–37, 41, 43

Inquiry activities are in Italics.

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CCC Crosscutting Concepts	
Systems and System Models • A system can be described in terms of its components and their interactions. (4-LS1-1)	*8–9*, 14–15, 16, *28–30*
CCSS Math Connections	
4.G.A.3	13
ELD Connections	
ELD.PI.4.10	Teacher's Edition *Only*: 11, 18, 31, 32
CCSS ELA/Literacy Connections	
W.4.1, a, b, c, d	33, 50, 87
RI.4.3	*19–21*
RI.4.7	37, 41
ALSO INTEGRATED	
SEP Asking Questions and Defining Problems	*8–9, 19–21, 28–30, 38–39*, 41, 49
SEP Planning and Carrying Out Investigation	8-9, *19–21, 28–30, 38–39*
Constructing Explanations and Designing Solutions	22, 31, *38–39*, 41, 42, 50
CCC Structure and Function	6–7, 12–13, 14–15, 16–17, 22, *29*, 26–27, 31, 32–33, 34–36, *38–39*, 41, 42, 45–50

MODULE: Information Processing and Transfer

4-LS1	From Molecules to Organisms: Structures and Processes	
4-LS1-2	**Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.** *[Clarification Statement: Emphasis is on systems of information transfer.] [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]*	64-65, *67–69*

Inquiry activities are in Italics.

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SEP Science and Engineering Practices	
Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2)	*59*, *69*, 72, *77*, 85
DCI Disciplinary Core Ideas	
LS1.D: Information Processing • Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions. (4-LS1-2)	62–63, 64–65, 71
CCC Crosscutting Concepts	
Systems and System Models • A system can be described in terms of its components and their interactions. (4-LS1-2)	*59*, 64–65, *67–69*, 71, *84–85*

4-PS3-2	Energy	
4-PS3-2	**Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.** *[Assessment Boundary: Assessment does not include quantitative measurements of energy.]*	*76–77*
SEP Science and Engineering Practices		
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. • Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.		*58–60, 67–69, 76–77, 84–85, 96–97, 100–101*

Inquiry activities are in Italics.

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DCI Disciplinary Core Ideas	
PS3.A: Definitions of Energy • Energy can be moved from place to place by moving objects or through sound, light, or electric currents.	*76–77*, 78–79, *97*
PS3.B: Conservation of Energy and Energy Transfer • Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. • Light also transfers energy from place to place. • Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy.	*76–77*, 78–79
CCC Crosscutting Concepts	
Energy and Matter • Energy can be transferred in various ways and between objects.	*76–77*, 78–79, *97*

4-PS4	Waves and Their Applications in Technologies for Information Transfer	
4-PS4-2	**Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.** *[Assessment Boundary: Assessment does not include knowledge of specific colors reflected and seen, the cellular mechanisms of vision, or how the retina works.]*	*76–77*
SEP Science and Engineering Practices		
Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions. • Develop a model to describe phenomena.		*59, 69*, 72, *77, 85*
DCI Disciplinary Core Ideas		
PS4.B: Electromagnetic Radiation • An object can be seen when light reflected from its surface enters the eyes.		78–79, 88–89, 91
CCC Crosscutting Concepts		
Cause and Effect • Cause and effect relationships are routinely identified.		*67–69, 76–77, 84–85*, 91

Inquiry activities are in Italics.

4-PS4	Waves and Their Applications in Technologies for Information Transfer	
4-PS4-3	**Generate and compare multiple solutions that use patterns to transfer information.** *[Clarification Statement: Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.]*	*96–97*, 111–116
SEP Science and Engineering Practices		
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems. • Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.		61, *67–69, 84–85, 96–97*, 111–116
DCI Disciplinary Core Ideas		
PS4.C: Information Technologies and Instrumentation • Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa.		104–105
ETS1.C: Optimizing The Design Solution • Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. *(secondary)*		65, 81, 109, 111–116
CCC Crosscutting Concepts		
Patterns • Similarities and differences in patterns can be used to sort and classify designed products.		*96–97, 100–101, 107*, 111–116
Connections to Engineering, Technology, and Applications of Science **Interdependence of Science, Engineering, and Technology** • Knowledge of relevant scientific concepts and research findings is important in engineering.		99
CCSS Math Connections		
4.OA.C		*96*, 111–116
4.MD.5, a, b; 4.MD.6		*76–77*
MP.2, MP.4, MP.5, MP.6		*76–77, 96*, 114

Inquiry activities are in Italics.

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ELD Connections	
ELD.PI.4.10	Teacher's Edition *Only*: 61, 63, 65, 79, 86, 87, 99, 102, 105
CCSS ELA/Literacy Connections	
RI.4.3	88–90, 87
W.4.1, RI.4.7	87
ALSO INTEGRATES:	
SEP Asking Questions and Defining Problems	*58–90, 67–69, 77, 84–85*
SEP Engaging in Argument from Evidence	61, 87
CCC Structure and Function	*58–60*, 62–63, *84–85*

Inquiry activities are in Italics.